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EXAMINER

SONG, SARAH U

ART UNIT PAPER NUMBER

2874

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Please find below and/or attached an Office communication concerning this application or proceeding.

HA

Office Action Summary	Application No. 10/772,615	Applicant(s) BROCKHAUS ET AL.	
	Examiner Sarah Song	Art Unit 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0204.0504</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The prior art documents submitted by the applicant in the Information Disclosure Statement filed on February 4, and May 12, 2004 have all been considered and made of record (note the attached copy of form PTO-1449).

Drawings

3. This application has been filed with five (5) sheets of drawings, which have been approved by the Examiner.

Claim Objections

4. Claim 5 is objected to because of the following informalities: in line 2, Examiner suggests changing “channelis” to —channel is—. Appropriate correction is required.
5. Claim 5 is objected to because of the following informalities: in line 2, Examiner suggests changing “converterto” to —converter to—. Appropriate correction is required.
6. Claim 20 is objected to because of the following informalities: in lines 7 and 8, “the assigned optical waveguide” lacks proper antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. **Claims 1, 2, 5, 7, 13, 16, 17, 19 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Hiramatsu (U.S. Patent 6,907,173).**

9. Regarding claim 1, Hiramatsu discloses an optical coupling unit 10 for coupling at least one optoelectronic converter to an assigned optical waveguide, wherein the coupling unit comprises a monolithic glass block in which at least one integrated light guiding channel 11 produced by variation of the refractive index, and least one reflection surface 13 at which light signals passing along the at least one integrated light guiding channel are deflected.

10. Regarding claim 2, the monolithic glass block has a reflection surface 13, which deflects the light signals by an angle of 90°. See column 5, lines 56-61.

11. Regarding claim 5, the integrated light guiding channel 11 is produced in the monolithic glass block by irradiation of ultrashort laser pulses. See column 13, line 46+. Furthermore, it is noted that the method of forming a device is not germane to the patentability of the device itself.

12. Regarding claim 7, the monolithic glass block comprises one of a one-dimensional array and a two-dimensional array of light guiding channels. See Figure 1.

13. Regarding claim 13, Hiramatsu discloses an optical arrangement for transferring light signals from at least one optoelectronic converter to an assigned optical waveguide, and from the optical waveguide to a coupling unit, wherein the coupling unit comprises a monolithic glass block including a first region 12 having a first refractive index and at least one integrated light guiding channel 11 extending through the first region and having a second refractive index, the glass block also having at least one reflection surface 13 arranged such that light signals passing

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along the at least one integrated light guiding channel are deflected, wherein the optoelectronic converter 20 and the assigned optical waveguide 25 are optically coupled to each other by the at least one light guiding channel of the coupling unit.

14. Regarding claim 16, an array of optoelectronic converters is optically coupled by a plurality of the light guiding channels formed in the monolithic glass block to an array of optical waveguides. See column 10, lines 5+.

15. Regarding claim 17, the array of optoelectronic converters is an array of VCSEL lasers. See column 3, lines 25+.

16. Regarding claim 19, the optoelectronic converter 20 is arranged on a planar substrate 17 together with further electrical components 16.

17. Regarding claim 20, Hiramatsu discloses an optical coupling unit for coupling an optoelectronic converter to an optical waveguide, the optical coupling unit comprising: a monolithic glass block having a first refractive index, the monolithic glass block defining a first surface 12a for receiving light signals from the optoelectronic converter, a second surface 12b for passing the light signals to the assigned optical waveguide, wherein the monolithic glass block further defines a light guiding channel 11 extending from the first surface to the second surface through the monolithic glass block, and wherein the light guiding channel is formed by altering a portion of the monolithic glass block such that the light guiding channel has a second refractive index that is greater than the first refractive index of unaltered regions of the monolithic glass block that surround the light guiding channel. See column 13, line 46+.

18. **Claims 1, 2, 6, 7, 13, 14, 16 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Murata et al. (U.S. Patent 6,793,405).**

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19. Regarding claim 1, Murata et al. discloses an optical coupling unit 10 for coupling at least one optoelectronic converter to an assigned optical waveguide, wherein the coupling unit comprises a monolithic glass block in which at least one integrated light guiding channel 12 produced by variation of the refractive index, and least one reflection surface 18 at which light signals passing along the at least one integrated light guiding channel are deflected.

20. Regarding claim 2, the monolithic glass block has a reflection surface 18, which deflects the light signals by an angle of 90° . See column 4, lines 15-17.

21. Regarding claim 6, the light signals are only guided in a light guiding channel 12 before or after the deflection. See Figure 1.

22. Regarding claim 7, the monolithic glass block comprises one of a one-dimensional array and a two-dimensional array of light guiding channels. See Figures 1 and 2.

23. Regarding claim 13, Murata et al. discloses an optical arrangement for transferring light signals from at least one optoelectronic converter to an assigned optical waveguide, and from the optical waveguide to a coupling unit, wherein the coupling unit comprises a monolithic glass block including a first region 14 having a first refractive index and at least one integrated light guiding channel 12 extending through the first region and having a second refractive index, the glass block also having at least one reflection surface 18 arranged such that light signals passing along the at least one integrated light guiding channel are deflected, wherein the optoelectronic converter 22 and the assigned optical waveguide (column 5, lines 35+) are optically coupled to each other by the at least one light guiding channel of the coupling unit.

24. Regarding claim 14, between the optoelectronic converter and the monolithic glass block is a gap, and the gap is sealed by a sealing material 34.

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25. Regarding claim 16, an array of optoelectronic converters is optically coupled by a plurality of the light guiding channels formed in the monolithic glass block to an array of optical waveguides. See Figure 2.

26. Regarding claim 19, the optoelectronic converter 22 is arranged on a planar substrate 10 together with further electrical components 20.

Claim Rejections - 35 USC § 103

27. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

28. **Claims 3, 4 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu.**

29. Regarding claim 3, Hiramatsu discloses the claimed invention except for the reflection surface 13 being mirror-coated. Mirror-coated reflection surfaces are well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a mirror-coated surface on the reflection surface 13 for the purpose of enhancing the reflectivity of the surface.

30. Regarding claim 4, Hiramatsu does not expressly disclose the glass block consisting of quartz glass. Quartz glass is well known in the art for optical waveguides. One of ordinary skill in the art would have been motivated to provide a quartz glass block since it was known in the art as a low loss waveguide material. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made in the art to provide a quartz glass

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block, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

See MPEP 2144.07.

31. Regarding claim 18, Hiramatsu does not expressly disclose the at least one optical waveguide in a plug receptacle to which an optical plug can be coupled. Optical waveguides in plug receptacles are well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the at least one optical waveguide in a plug receptacle for the purpose of facilitating optical connections to the at least one optical waveguide.

32. **Claims 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu as applied to claim 1 above, and further in view of Kropp et al. (U.S. Patent 6,457,875).**

33. Regarding claims 8 and 9, Hiramatsu does not disclose a lens or lens array.

34. Kropp et al. discloses a coupling device comprising lenses to shape the light entering or leaving the coupling device.

35. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the lenses on the input and output surfaces of the coupling block 10 of Hiramatsu for the purpose of improving the coupling between the respective components.

36. Regarding claims 10-12, planar lenses with refractive index gradients, plastic injection-molded lenses and lenses applied by means of lithographic technique are well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide any type of lens for beam shaping since applicant has not

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disclosed that the particular type of lens solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with various known lenses.

37. **Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu as applied to claim 13 above, and further in view of Osugi et al (U.S. Patent 5,970,192).**

38. Regarding claim 15, Hiramatsu does not expressly disclose a gap between at least one optical waveguide and the monolithic glass block, and wherein the gap is sealed by a sealing material.

39. Osugi et al. discloses a gap between an optical waveguide and a coupling device, the gap being sealed by a sealing material. See column 6, lines 33+.

40. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the gap and sealing material as claimed for the purpose of providing a rugged connection between the respective components.

Conclusion


41. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Song whose telephone number is 571-272-2359. The examiner can normally be reached on M-Th 7:30am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Sarah Song
Patent Examiner
Group Art Unit 2874